



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,826	09/07/2004	Shinji Isokawa	10921.246USWO	8911
7590	09/07/2006		EXAMINER	
Hamre, Schumann, Mueller & Larson, P.C. P.O. Box 2902-0902 Minneapolis, MN 55402			HU, SHOUXIANG	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 09/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/506,826		ISOKAWA ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Shouxiang Hu		2811	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 June 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) 5-7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claims 5-7 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on March 16, 2006.

### ***Claim Objections***

2. Claims 1-4 are objected to because of the following informalities and/or defects:

Claim 1 recites the term of "formed with a die pad made of a metal film and a pair of electrode terminals", but fails to clarify what is/are their relationship(s) with the recited substrate. And, according to the elected species of Fig. 1, at least portions of the electrical terminals (4 and 5) in the instant invention are formed at the back surface of the substrate (2) in opposite to the recited obverse surface.

Claim 1 recites the subject matter of "a longitudinal centerline", but fails to define which direction is the longitudinal direction, and/or at what level the recited centerline is positioned.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 and 2, as being supported by the elected species and as being best understood in view of the claim objections above, are rejected under 35 U.S.C. 102(b) as being anticipated by Sano (Sano et al., WO99/60626, Nov., 25, 1999; please see US 6,486,543 for its English translation).

Sano discloses a semiconductor device (Figs. 1-29, particularly see Figs. 1, 2, 12-14 and 28), comprising: a naturally insulating substrate (5, and/or, the lower portion of the resin package 4, as each of them can function as a support for the die pad 10b thereon), wherein the substrate has an observe surface, and a die pad (10b) made of a metal film and a pair of electrode terminals (at least a portion of each of 1 and 2; such as: 11a and/or 11b for the terminal 1, and, 21a and/or 21b for the terminal 2 ) made of a metal film are formed on the substrate; a semiconductor chip (LED) bonded to an obverse surface of the die pad with a die bonding material (see col. 8, lines 16-29); and a molded portion (at least the upper portion of the resin package 4; naturally light permeable) made of a synthetic resin for packaging the semiconductor chip.

The device further comprises a narrow patterned conductor (a portion of the terminal 1 that is between the die pad 10b and the terminal pad 11a and/or 11b; it is narrow compared to the die pad 10b) made of a metal film is provided between the die pad and one of the electrode terminals to integrally connect the die pad and the electrode terminal to each other, the die pad (10b) having a length and a width which are 0.50 to 1.50 times a length and a width of the semiconductor chip (3), respectively.

And, the die pad, the pair of electrode terminals and the narrow patterned conductor in combination provide an overall conductor pattern that is asymmetrical with respect to a longitudinal centerline (a line in a direction that is perpendicular to the cross section shown in Fig. 2) of the insulating substrate. The narrow patterned conductor (especially the bent portion of the terminal 1 that is between the die pad 10b and the terminal 11a and/or 11b) extended obliquely (i.e., indirectly) and being offset from the longitudinal centerline.

Furthermore, it is noted that the term of "formed with" recited in claim 1 and any potential process implications, such as the one regarding how the recited substrate and/or the recited die pad and/or the recited electrode terminals are formed, are treated here as process limitations; and such process limitations would not carry patentable weight in this claim drawing to a structure, because distinct structure is not necessarily produced. In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding claim 2, the die pad (10b) in Sano has a side surface integrally formed with a narrow extension (side portion(s) of 10) projecting outward from the die pad.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2811

4. Claims 3 and 4, as being supported by the elected species and as being best understood in view of the claim objections above, are rejected under 35 U.S.C. 103(a) as being unpatentable over Sano in view of Kwan (Kwan et al., US 6,872,661).

The disclosure of Sano is discussed as applied to claims 1 and 2 above.

Although Sano does not expressly disclose that the die pad can be formed with a recess of a size insufficient to receive the semiconductor chip, one of ordinary skill in the art would readily recognize that such recess can be desirably formed in the die pad for reducing adverse stresses due to thermal expansion, as evidenced in Kwan (see the recess in the die pad 202 in Fig. 1H; also see col. 5, lines 32-42).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the die-pad recess of Kwan into the device of Sano, so that a device with reduced adverse stress would be obtained.

### ***Response to Arguments***

5. Applicant's arguments with respect to claims 1-4 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shouxiang Hu whose telephone number is 571-272-1654. The examiner can normally be reached on Monday through Thursday, 7:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

Application/Control Number: 10/506,826

Page 7

Art Unit: 2811

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SH  
August 30, 2006

A handwritten signature in black ink, appearing to read 'S. Hu', with a stylized, flowing script.

**SHOUXIANG HU  
PRIMARY EXAMINER**